

Work Order ID 80115

80115

Page 1

February-10-12 10:06:09 AM

Item ID: D6104-007

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Round Billet, 17-4

Start Date: 10/02/2012 Start Qty: 10.00

10

Cust Item ID:

Required Date: 24/02/2012 Req'd Qty: 10.00

10

Customer:

Reference:

Approvals:

Process Plan: MLJ

Date: 12/02/10

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
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D6104	Rev B
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100	PURCHASING	0.00
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100

Purchasing

Memo

0.00

Purchasing

Issue P/O: 16168 a)Description: S.S round billet b) Ø4.50" x 5.10" long c) Tolerance on all dimensions are +0.030"/-0.000" d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)e)One blank makes 2 partsf) Material certification required

CL 12/02/10 10

110	Receive & Inspect for Damage & Mat'l Certs	0.00
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110

Packaging

Memo

0.00

Packaging

Ensure material certification is attached

CL 12/02/10 10

120	QC6- Inspect dimensions to drawing	0.00
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120

QC

Memo

0.00

Quality Control

Ensure Material certification comply to Dwg D6104

CL 12/02/24 10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 80115

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February-10-12 10:06:09 AM

Item ID: D6104-007 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Round Billet, 17-4
 Start Date: 10/02/2012 Start Qty: 10.00 *10* Cust Item ID:
 Required Date: 24/02/2012 Req'd Qty: 10.00 *10* Customer:
 Reference:

Approvals: Process Plan: Date: Tooling: Date: Run Start *NR1*
 QC: Date: SPC (Y/N): Date: Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: MAT47	0.00							
130									
Packaging	Memo	0.00				10			
Packaging									
140	QC21- Final Inspection - Work Order Release	0.00							
140									
QC	Memo	0.00							
Quality Control									

12-02-24
 (10)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

February-10-12 10:06:13 AM

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Work Order ID: 80115

80115

Parent Item: D6104-007

D6104-007

Parent Item Name: Round Billet, 17-4

Start Date: 10/02/2012

Required Date: 24/02/2012

Start Qty: 10.00

Required Qty: 10.00

Comments: IPP A: 01.05.08New Issue EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-007P		Purchased	No			110	Each	0.0000	1	10			
D6104-007P									**				
17-4 SS Roundbar 4.50"OD													

10/2/2012 (10)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

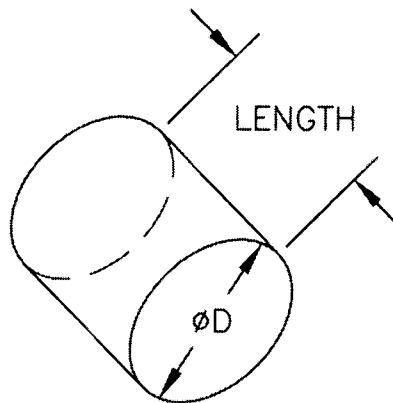


DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

SPECIFICATION CONTROL DRAWING



SUPPLY BY
MATERIAL
17-4 PH STAINLESS STEEL
FOR 17-4 PH STAINLESS STEEL
COPY
80115-MC-J
12/02/10

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**Castle Metals®**

A. M. Castle & Co.

PACKING SLIP

Page 1 of 1

Shipment No:1192121

Ship From: A. M. Castle & Co. (Canada) Inc. MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CAN		Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
Date Shipped 17-FEB-2012	F.O.B. ORIGIN	Freight Terms Prepaid		Carrier MANITOULIN		BOL No 1192121-2	

Shipment Details	Final Destination Branch - MON
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Order No 2004085	Line No 2	Item No 14998.MO	Description 4.5000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN (+ .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643				
Purchase Order No 16168		Part Number YOUR ITEM NUMBER: D6104-007		Ordered Qty 10.00 PCS		Invoice Qty 10.00 PCS	
Details							
Delivery No. 117372343	Mill	Heat Number 527171	Mech Id	PCS 10	Width (IN)	Length (IN)	Shipped Qty(LBS) 236.43

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:

Name:



Certificate of Test

HEAT 527171

ORDER 619369/ 06 BOL 0212135 * CERTIFICATION * 05/23/11

SHIP TO:
A. M. CASTLE METALS
3400 NORTH WOLF ROAD

FRANKLIN PARK 601310000

88513

YOUR ORDER & DATE
5/23/11 CUST# 0254001 CUST TAG#14998

ITEM DESCRIPTION
GRADE 17-4 Ship Condition CONDA
Size 17-4 RND HRART CONDA 4.5000 x 144.000 RL
Country of Melt: SWEDEN Country of Mfg.: UNITED STATES
NAFTA Country of Origin is Country of Melt
No weld repair
Free of mercury contamination, Free of radiation contamination
No WEEE relevant substances; Meets EU electrical ROHS

Total Bundles 1 Total Weight 2065

WO 2016769 Bundles: 1G

SPECIFICATIONS
MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED SWEDEN
AMS 2303F AMS 5643R
UNS S17400, AISI 630 ASME SA564 E10
ASTM A484 11 ASTM A564 10 Type 630
DFARS 252.225.7014 6/05 AMC 3174-02 R31
Sol Ann 1900F/1Hr/Rapid Cool AISI 630, UNS S17400
Reduction Ratio 3:1 minimum
H900 capability sample aged at 900F/1hr/AC then tensile and HRC tested

MECHANICAL & OTHER TESTS
Hardness as shipped 294 HB Hardness as tested 421 HB
Hardness as shipped 031 HRC Hardness as tested 45 HRC
Grain size 5.5 Tensile strength, KSI (MPa) 200.0 (1379)
Micro OK 0.2% Yield Strngth, KSI (MPa) 180.0 (1241)
Intergranular corrosion OK
Macro OK
Ferrite .0 Elongation % in 4D 12.0
Reduction of area % 44.0

CHEMICAL COMPOSITION
Carbon (C) .010 Manganese (Mn) .710
Phosphorus (P) .025 Sulphur (S) .025
Silicon (Si) .360 Chromium (Cr) 15.320
Nickel (Ni) 4.680 Cobalt (Co) .036
Copper (Cu) 3.420 Moly (Mo) .170
Nitrogen (N) .021 Columbium (Cb) .230
Titanium (Ti) .005 Aluminum (Al) .003
Tin (Sn) .006 Cerium (Ce) .010
Boron (B) .001 Tantalum (Ta) .005
Vanadium (V) .036 .000
Columbium/ Tantalum (Cb+Ta) .235
Iron (Fe) Balance
Frequency .000 Severity .000
Melt Practice EAF
Refining Practice AOD
De-long Ferrite

Knowingly & willfully falsifying or concealing a material act on this form, or making false, fictitious or fraudulent statements or representations herein could constitute a felony punishable under federal statutes. We hereby certify that the test results shown in this report are correct and accurate as contained in the records of the company and are in compliance with the specifications, codes, and standards listed above.

M.F. Marcanio, Quality Manager

M.F. Marcanio

HEAT NUMBER 527171
MECHANICAL ID 17998
ITEM CODE 88513
LOT NUMBER 526204
PO NUMBER 0470KUMPP
SUPPLIER
SPECIFICATION
LCS
COMMENT
APPROVED

Castle Metals FP